UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TAKASHI HORAI,
SYUJI TSUKAMOTO, NARUTOSHI FUKUZAWA,
and HIROYUKI ARIOKA

Appeal 2008-1498
Application 10/640,246
Technology Center 1700

Decided: October 31, 2008

Before CHUNG K. PAK, CHARLES F. WARREN, and
PETER F. KRATZ, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

DECISION ON APPEAL

Applicants appeal to the Board from the decision of the Primary Examiner finally rejecting claims 1 through 6, 8 through 11, and 13 through 22 in the Office Action mailed April 24, 2006, and refusing to allow claims 1 through 6, 8, 10, 11, 13 through 20, and 22 as subsequently amended in the Amendment filed July 19, 2006 (Amendment) which was entered in the

Advisory Action mailed August 3, 2006. The Amendment further cancelled claims 9 and 21. 35 U.S.C. §§ 6 and 134(a) (2002); 37 C.F.R. § 41.31(a) (2006).

We affirm the decision of the Primary Examiner.

Claim 1 illustrates Appellants' invention of an optical recording medium, and is representative of the claims on appeal:

1. An optical recording medium including at least a substrate and a recording layer arranged on the substrate, wherein:

said recording layer contains at least a first dye which is a main component of the recording layer, and which has a maximum absorption wavelength in a range of 450 to 600 nm, and a second dye which has a maximum absorption wavelength in a range of 600 to 750 nm, and

a content of said second dye in said recording layer is adjusted so as to afford a mass ratio of first dye and second dye of from 99:1 to 97:3 and to simultaneously satisfy conditions represented by the following equations (1) to (3):

(1) $0.03 \leq \alpha$

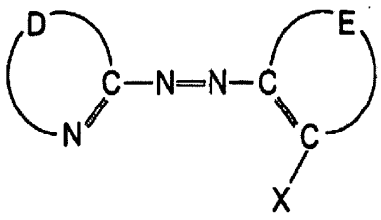
(2) $0.03 \leq \beta$

(3) $0.7 \leq (\beta/\alpha) \leq 1.05$,

where α denotes an attenuation coefficient of said recording layer with respect to a light of a wavelength 655 nm, and

β denotes an attenuation coefficient of said recording layer with respect to a light of a wavelength 670 nm,

and wherein said first dye has at least a coordination center made of a metal or a metal ion, and a ligand represented by the following formula (I):



…(I)

where D denotes a divalent residue bonded to a nitrogen atom and a carbon atom bonded to the nitrogen atom to form a heterocycle or a condensed ring including a heterocyclic,

E denotes a divalent residue bonded to two carbon atoms bonded to each other to form a condensed ring,

X denotes a hydroxyl group, a carboxyl group, a sulfonic acid group, a sulfonic acid derivative group, or a characteristic group represented by $–NSO_2Q$, and Q in the characteristic group denotes a C_1 to C_6 alkyl group in which at least one hydrogen atom may be substituted by a halogen atom.

The Examiner relies upon the evidence in these references (Ans. 3):

Horai	US 7,022,393 B2	Apr. 4, 2006
Takazawa[1]	JP 2001-150815 A	Jun. 5, 2001

Appellants request review of the following grounds of rejection advanced on appeal by the Examiner (App. Br. 7-8):

claims 1 through 6, 8, 10, 11, 13 through 20, and 22 under 35 U.S.C. § 103(a) as unpatentable over Takazawa (Ans. 3); and,

claims 1 through 6, 8, 10, 11, 13 through 20, and 22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 16 of Horai (Ans. 4).

With respect to the first ground of rejection, Appellants argue independent claim 1; independent claim 15; claims 2 and 16; claims 3 and 17; claims 4 and 18; claims 6 and 19, with the remaining claims standing or falling with the independent claim on which they depend. App. Br. 11, 17, 18, 19, and 20. Appellants argue the claims of the second ground of rejection as a group. Thus, we decide this appeal based on claims 1, 15, 2, 3, 4, and 6. 37 C.F.R. § 41.37(c)(1)(vii) (2006).

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[1] We refer to the translation of Takazawa prepared for the USPTO by FLS, Inc. (PTO 08-0641 November 2007) and submitted to Appellants in the Office Communication mailed November 28, 2007, in response to our Remand entered October 26, 2007.

The principal issues in this appeal are whether Appellants have shown the Examiner has not carried the burden of establishing a prima facie case in each of the grounds of rejection advanced on appeal which turn on the issues addressed below.

The plain language of independent claims 1 and 15 specify an optical medium that includes, among other things, a recording layer that contains, among other things, at least one "first" dye as a main component, wherein the dye has a maximum absorption wavelength in the range 450 to 600 nm and is a metallized azo dye compound falling within structural formula (I); and a "second" dye which has a maximum absorption wavelength in the range 600 to 750 nm and can be a pentamethine cyanine dye compound (n is 2) or a heptamethine cyanine dye compound (n is 3) falling within structural formula (II) encompassed by dependent claims 10 and 22. Claim 1 specifies the mass ratio of the first and second dyes is from 99:1 to 97:3, and claim 15 specifies the content of the second dye is from 1 mass % to 3 mass % based on total weight of the recording layer. Both claims further specify that the content of the second dye is further dependent on satisfying the conditions specified in the three equations with respect to attenuation coefficients of the recording layer at wavelengths of 655 nm and 670 nm specified in claim 1. In other words, the content of the second dye falls within the specified mass ratio range and the specified mass % range based on the three equations with respect to the attenuation coefficients. *See* App. Br. 11-12.

Considering first the ground of rejection under § 103(a), we find Takazawa would have disclosed to one of ordinary skill in this art an optical medium that includes, among other things, a recording layer that contains,

among other things, a metallized azo dye compound which has a maximum absorption wavelength in the range 500 to 620 nm and falls within structural formula (1), and an infrared absorbent compound that can be a "cyanine compound." Takazawa, e.g., pp. 6-10, ¶¶ 0008-0016. The metallized azo dye compound is the main component and thus, the recording layer shows a maximum absorption wave length in the range 500 to 620 nm. Takazawa pp. 8-9, ¶ 0012. The infrared absorbent compound is mixed with the metallized azo compound to prevent oxidation of the complexed metal of that compound and thus prevent "deterioration in the recording/reproducing characteristics of the optical recording medium." Takazawa pp. 7-8 and 10, ¶¶ 0009 and 0016.

Takazawa further discloses that other pigments can be used "to improve recording characteristics," including, among other things, "cyanine pigment," wherein the "blend ratio of these pigments should be around 0.1 wt% - 30 wt% of the azo compound." Takazawa p. 12, ¶ 0020. Takazawa discloses no examples of cyanine pigment compounds which improve recording characteristics.

Takazawa illustrates the recording layer in, among other things, Example 10 wherein a metallized azo dye compound of structural formula (3) is combined with a heptamethine cyanine infrared absorber compound of structural formula (10) and the mixture is used to form a recording layer that has a maximum absorption wave length in the range 598 nm. Takazawa pp. 27-28, ¶¶ 0062-0063. The metallized azo dye compound of structural formula (3) falls within structural formula (I) in appealed claims 1 and 15, and the heptamethine cyanine infrared absorber compound of structural

formula (10) falls within structural formula (2) in appealed claims 10 and 22. Takazawa Example 10 follows the procedure of Takazawa Example 1, and thus, the metallized azo compound and the heptamethine cyanine compound are used at a weight ratio of 90/10. Takazawa pp. 17-20 and 27-28, ¶¶ 0034-0040 and 0027-0028. In Takazawa Example 10, the characteristics of the optical recording medium containing the recording layer "[a]fter 500 hours of light resistance test by a xenon fade meter acceleration test" were "favorable." Takazawa p 28, ¶ 0064; *see also* pp. 19-20, ¶¶ 0037-0040.

In Takazawa Example 4, the same metallized azo dye compound and infrared absorber compound use in Example 1 are combined at a weight ratio of 90/5. Takazawa p. 22, ¶ 0045. No other compound was included in the mixture used to form the recording layer in Example 10 or in the other Examples. Takazawa pp. 17-18, 20, 21, 22-23, 23-24, 24-25, 25-26, 26-27, and 27, ¶¶ 0034, 0037, 0041, 0043, 0045, 0047, 0050, 0053, 0056, 0059, and 0062.

The heptamethine cyanine compound of Takazawa's formula (10) has a C_4 group in the positions represented by structural formula members R^1 and R^2 in the structural formula (2) in each of appealed claims 10 and 22. Appellants' heptamethine cyanine compounds of formulae (B4) and (B7) have a C_5 group and a C_1 group, respectively, in the positions represented by structural formula members R^1 and R^2 in structural formula (II) set forth in each of appealed claims 10 and 22. Spec. 29-30. Each of these three compounds fall within Appellants' structural formula (II) wherein structural

formula members R^1 and R^2 are defined as "an alkyl group having 1 to 6 carbon atoms." Spec. pp. 25-26, ¶¶ 0072-0073.

We determine the teachings of Takazawa, the scope of which we determined above, provide sufficient evidence supporting the Examiner's case that the claimed optical recording medium encompassed by claims 1 and 15, as we interpreted these claims above, would have been prima facie obviousness to one of ordinary skill in the optical recording medium arts familiar with the ingredients of recording layers in these articles. As the Examiner points out, Takazawa's Example 10 illustrates a recording layer containing a metallized azo dye compound that falls within structural formula (I) as well as in the maximum absorption wavelength range of claims 1 and 15. The cyanine infrared absorber compound of structural formula (10) in Example 10 is the next lower methyl homologue of Appellants' cyanine compound of structural formula (B4) and a higher homologue of Appellants' cyanine compound of structural formula (B7). These three compounds fall within Appellants' disclosed and claimed structural formula II, and thus would fall within the maximum absorption wavelength range for the "second" dye compounds in claims 1 and 15.

We determine one of ordinary skill in this art would have reasonable inferred from Takazawa[2] that the amount of cyanine infrared absorber compound that can be mixed with the metallized azo dye compound has an

[2] It is well settled that a reference stands for all of the specific teachings thereof as well as the inferences one of ordinary skill in this art would have reasonably been expected to draw therefrom, *see In re Fritch*, 972 F.2d 1260, 1264-65 (Fed. Cir. 1992); *In re Preda*, 401 F.2d 825, 826 (CCPA

upper limit determined by the maximum absorption wavelength of the recording layer which is based on the maximum absorption wavelength of the metallized azo dye compound. While Takazawa does not disclose a lower limit on the amount of cyanine infrared absorber compound, this person would reasonably infer that the amount can be reasonably determined based on the desired degree of oxidation protection for the metallized azo dye compound based on the extent to which deterioration in the recording/reproduction characteristics of the optical recording medium can be tolerated.

Thus, we determine that, prima facie, one of ordinary skill in this art routinely following the following the teachings of Takazawa would have reasonably determined a useful range of the amounts of cyanine infrared adsorber compound commensurate with the extent of oxidation protection desired. *See, e.g., In re Aller*, 220 F.2d 454, 456-58 (CCPA 1955) (it is not inventive to discover by routine experimentation optimum or workable ranges for general conditions disclosed in the prior art). We base our determination on Takazawa's disclosure as a whole and not on the specific mass ratios of metallized azo dye compound to cyanine infrared absorber compound of 90/10 and 90/5 disclosed in Takazawa's Examples. *See, e.g.*, *Merck & Co., Inc. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) ("But in a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art,

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1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743 (Fed. Cir. 1985).

including unpreferred embodiments, must be considered.'") (quoting *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976)).

Accordingly, we are of the opinion that on this record, prima facie, one of ordinary skill in this art routinely following the teachings of Takazawa would have reasonably arrived at a mass ratio range for the metallized azo dye compound to cyanine infrared absorber compound used in Takazawa's Example 10 which would encompass or overlap with the mass ratio range set forth in each of claims 1 and 15, thus obtaining an optical recording medium including a recording layer specified in these claims, as we have interpreted them above, without recourse to Appellants' Specification. This is so even if the claimed mass ratio range falls at the lower end of the mass ratio range in which one of ordinary skill in this art would employ cyanine infrared absorber compounds for Takazawa's purpose. *See, e.g., In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (no statement in the reference discouraging one of ordinary skill in the art from employing an element at the low end of a range for that element); *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994) (inferior results do not establish that a product is unusable for the purpose).

Upon reconsideration of the record as a whole in light of Appellants' contentions, we are of the opinion that Appellants have not successfully shown the Examiner has not carried the burden of establishing a prima facie case of obviousness. On this record, we agree with Appellants' contentions that it has not been established that Takazawa's disclosure of the amount of cyanine pigments that can be used to improve recording characteristics would not control the amount of cyanine infrared absorber compound used

to protect the metallized azo dyer compound in the recording layer of the optical recording medium disclosed in the reference. App. Br., e.g., 12-14; Reply Br., e.g., 2-3 and 5. However, as the Examiner points out, Takazawa does disclose that a cyanine infrared absorber compound will prevent oxidation of the complexed metal of the metallized azo dye compound and thus, would use an amount of a cyanine infrared absorber compound which will accomplish that purpose. Ans., e.g., 3-4.

We are not convinced that the claimed range of amounts of cyanine infrared absorber compound based on the mass ratio of metallized azo dye compound therewith as determined by Appellants' specified requirements patentably distinguishes the claimed optical recording medium over that of Takazawa as Appellants contend. App. Br., e.g., 14-16; Reply Br., e.g., 3-4 and 5-6. Indeed, one of ordinary skill in this art routinely following Takazawa can arrive at a mass ratio within Appellants' claimed mass ratio ranges based on Takazawa's teaching to use the cyanine infrared absorber compound to prevent degradation of the metallized azo dye compound without following Appellants' analysis to arrive at the same mass ratio. *See, e.g., In re Kronig*, 539 F.2d 1300, 1304 (CCPA 1976) (The reference provides "ample motivation to add water to increase product yields, and we do not view the rejection as deficient merely because appellants allege a different advantage resulting from the addition of water. Obviousness under 35 USC 103 does not require absolute predictability, . . . and it is sufficient here that [the reference] clearly [suggests] doing what appellants have done." (citations omitted)); *cf., e.g., In re Skoner*, 517 F.2d 947, 950-51 (CCPA 1975) ("Appellants have chosen to describe their invention in terms

of certain physical characteristics. . . . Merely choosing to describe their invention in this manner does not render patentable their method which is clearly obvious in view of [the reference]." (Citation omitted)).

Appellants have not established the criticality of the mass ratio ranges over the teachings of Takazawa. *See, e.g., In re Woodruff*, 919 F.2d 1575, 1577-78 (Fed. Cir. 1990), and cases cited therein (where the difference between the claimed invention and the prior art is a range, applicant must show that the claimed range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range). In this respect, Appellants' contention that a low amount of cyanine infrared absorber compound "would likely not afford any appreciable (or at least not the desired) protective effect" in Takazawa's recording layer is unsupported. Reply Br. 3. *See*, *e.g.*, *Geisler*, 116 F.3d at 1470; *In re De Blauwe*, 36 F.2d 699, 705 (Fed. Cir. 1984); *In re Payne*, 606 F.2d 303, 315 (CCPA 1979); *In re Lindner*, 457 F.2d 506, 508 (CCPA 1972).

Turning now to dependent claims 2, 3, 4, and 6, these claims specifies an attenuation coefficient with respect to the recording layer (claim 2), the metallized azo dye compound (claims 3 and 4), and the 'second" dye (claim 6). Appellants contend Takazawa does not describe this characteristic for these elements. App. Br. 18-21; Reply Br. 6-7. We agree with Appellants that the reference does not discloses these characteristics, but the fact that Appellants do so does not alone establish patentability. *See, e.g., Skoner*, 517 F.2d at 950-51. The Examiner has established that it reasonably appears the recording layer of Takazawa's Example 10 is identical or substantially identical to the claimed recording layers of claims 1 and 15. Indeed, the

metallized azo dye compound and the cyanine absorber compound used to prepared the recording layer fall within Appellants' formulae (I) and (II) in claims 1, 10, 15, and 22, and the metallized azo dye compound falls within the claimed maximum absorption wavelength range of claims 1, 3, and 15. Accordingly, the burden has shifted to Appellants to patentably distinguish the patentability of claims 2, 3, 4, and 6 over Takazawa by effective argument and/or objective evidence. *See, e.g., In re Spada*, 911 F.2d 705, 708-09 (Fed. Cir. 1990); *In re Best*, 562 F.2d 1252, 1255-56 (CCPA 1977); *Skoner*, 517 F.2d at 950-51. We find no such argument or evidence in the record.

Accordingly, based on our consideration of the totality of the record before us, we have weighed the evidence of obviousness found in Takazawa with Appellants' countervailing evidence of and argument for nonobviousness and conclude that the claimed invention encompassed by appealed claims 1 through 6, 8, 10, 11, 13 through 20, and 22 would have been obvious as a matter of law under 35 U.S.C. § 103(a).

Considering now the ground of rejection of claims 1 through 6, 8, 10, 11, 13 through 20, and 22 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 through 16 of Horai, Appellants' sole contention is that Horai's patent claims would not lead to "a recording layer with attenuation coefficients which satisfy equations (1) to (3)" specified in the appealed claims. App. Br. 21. The Examiner points out that both sets of claims encompass metallized azo dyes compound as the first dye and pentamethine cyanine dyes as the second dye in mass ratios falling within the appealed claims, and

thus would exhibit the attenuation properties specified in the appealed claims. Ans. 4-5. We agree with the Examiner as, indeed, it reasonably appears from the similarity of ingredients and amounts that the patent claims encompass recording layers would have attenuation coefficients which satisfy equations (1) to (3) specified in claims 1 and 15. Thus, the burdens shifts to Appellants to establish otherwise and we find no evidence or argument in the record establishing that Appellants have carried their burden. *Cf., e.g., Spada*, 911 F.2d at 708-09; *Best*, 562 F.2d at 1255-56; *Skoner*, 517 F.2d at 950-51.

Accordingly, we determine the Examiner has established a prima facie case of obviousness-type double patenting, and remain of that view upon reconsideration in light of Appellants' contention. Therefore, we affirm this ground of rejection.

The Primary Examiner's decision is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

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